

Essential Points of Specification Preparation

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1. Target product and target technology

Personal digital assistant device equipped with a color display (cellular mobile telephone, etc.)

2. Purpose and positioning of the application

[Person in charge]:

In personal digital assistant devices typified by cellular mobile telephones, it is required to be equipped typically with a display for indicating various kinds of information, and to contrive ways to reduce power consumption to prolong time for using the device because they are mobile devices. Thus, there is a high possibility for the invention of the present case to be implemented.

[Section chief]:

Ditto

3. Scope of claim for Patent (the number of claims:)

1. A personal digital assistant device, comprising:
display means capable of expressing in monochrome and polychrome; and

controlling means for controlling display colors when displaying data on said display means,

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wherein said controlling means switches the display between monochrome display and polychrome display according to the type of data to be displayed on said display means.

2. The personal digital assistant device according to claim 1, wherein, when the data displayed on said display means is of character data type only, said control means displays said character data in monochrome.

3. A personal digital assistant device comprising:
display means capable of expressing in monochrome and polychrome;

a polychrome light source provided to express said polychrome

a drive circuit that drives said light source; and
control means that controls the action of said drive circuit,

wherein said control means controls the action of said drive circuit according to the type of data to be displayed on said display means to emit only one color from the polychrome light source.

4. Considerations in preparation of scope of claim for patent (scopes included, reasons for limitation)

The scope of claim for patent is not limited to a cellular mobile telephone.

5. Prior art and problems

Personal digital assistant devices represented by a cellular mobile telephone is typically equipped with a monochrome display for displaying various types of information. In recent years, transmission of photographs and moving images has become possible and, as a result, a

demand for color display has increased.

• Japanese Unexamined Patent Publication No. Hei 10-200960 discloses a personal digital assistant device that is equipped with a monochrome LCD and a color LCD, and intends to reduce power consumption by selecting either one of the two modes according to the type of the data displayed.

6. Problems to be solved

• Portable devices are operated using a battery as their power source, and therefore it is necessary to reduce power consumption and prolong the operating time. However, a color display has the disadvantage that it requires more electric energy than a monochrome display, resulting in shortened operating time.

• In small size portable devices like a cellular telephone, provision of a plurality of displays causes inconveniences of having small size displays and operating portion.

7. Embodiment

• A single color display is used.

• According to the type of data to be displayed, a display is switched between a monochrome and a color mode.

• For example, in the case where only character information is displayed on the entire screen such as mail, the display is provided in monochrome.

• Photographs (transmitted) are displayed in full color.

• With respect to power saving

In the case where a color display is performed by means of a three-light source emitting RGB colors each

source arranged for one pixel, in order to display character information only. For example, only the G color light source circuit is driven to emit G color light, while the other displaying circuits R and B are at rest. This results in power saving.

8. Effects

Power saving achieved in the portion for displaying within the device makes prolonged operation possible.

9. Other points to be noted when preparing a specification (patentability, division, disclosure scope)

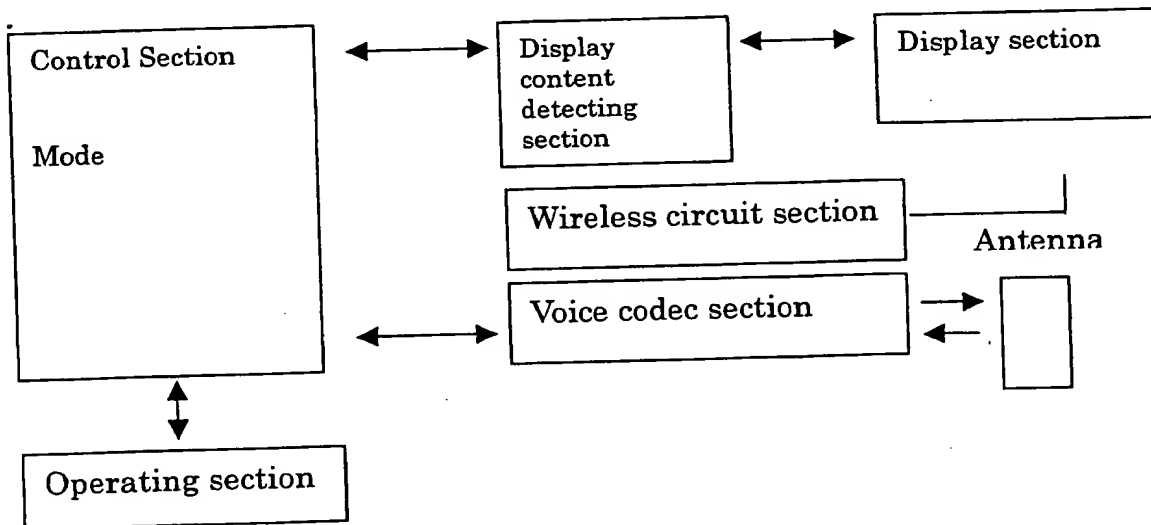
[Materials attached]

Japanese Unexamined Patent Publication No. Hei 10-200960

Block diagram according to the present invention

Flowchart according to the present invention

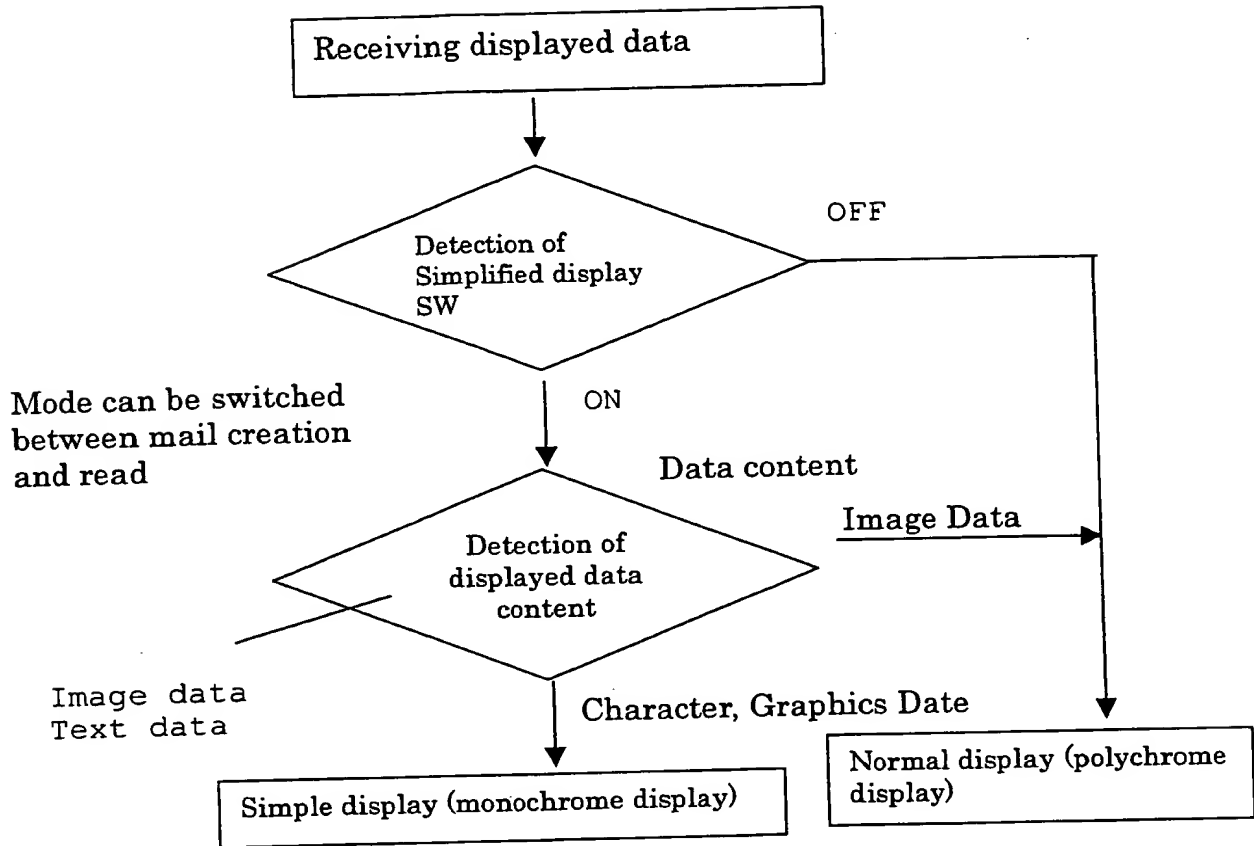
•Block diagram



Note: The display content detecting section is included in the control section in some cases.

: The voice codec section can be omitted.

Flow chart



Others (explanation of reasons for achievement of power saving)

1. Personal digital assistant devices have become able to handle image data as well as other types of data. Thus, the demand for colorization capability has increased for display devices.

2. Actually, the need to handle character and graphic data as well as image data is also great. (This is the mainstream.)

3. Monochromic displays function well enough to transmit necessary character and graphic data.

4. Installation of a plurality of optimal display devices for image and character data causes many disadvantages of all natures to portable devices, which must be of small size, lightweight, low power consumption, and the like.

5. Thus, display devices that are able to display a plurality of colors suitable for image data are also used for character and graphic data. Any one of the colors (subtractive color is also possible) that the display devices can display is selected for displaying character and graphic data.

6. For example, in the case where the white color of a background is made by displaying all the colors to be displayed, reduction in the total power consumption can be achieved by blacking out the colors of the background and displaying the character portion in monochrome to reduce the voltage applied to most dots. Therefore, the overall electric consumption can be reduced. An effect of the reduced power consumption is more remarkable on a TFT driven LCD and a self-emitting EL display device.

7. As described above, reduction in the number of colors to be displayed brings very few disadvantages because necessary information to users is transmitted satisfactorily if the data content to be transmitted is of character or graphic type.

8. The power which has been saved by reducing the number of colors to be displayed can be used to prolong the operating time of portable devices, so that the user can easily obtain advantages such as small size, lightweight, and prolonged operating time.